

Shape Memory Effect Actuators from Chlorides, Phase I

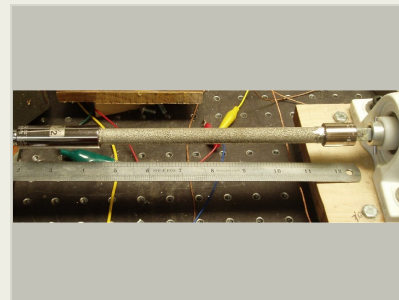
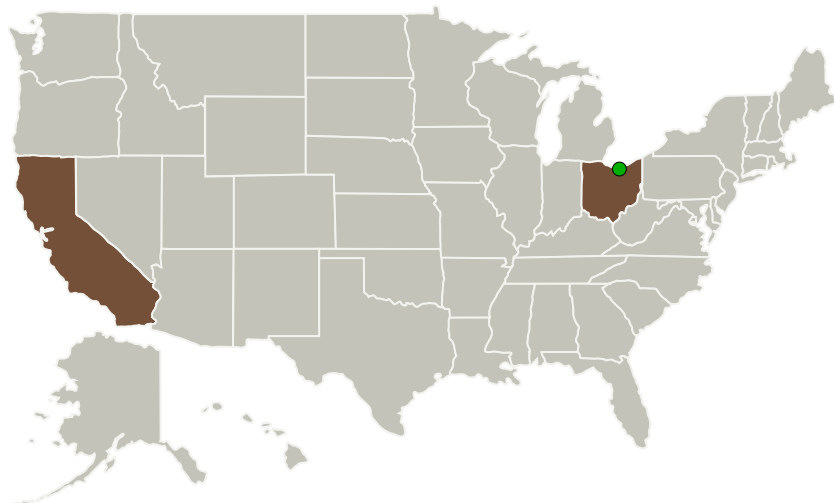
Completed Technology Project (2014 - 2014)



Project Introduction

Shape Change Technologies is developing a radical new technique for the fabrication of Shape Memory alloys, such as TiNi and its ternary alloys of Hf, Zr, and Cu. The technique utilizes these components as chloride feedstock, which are then decomposed onto a substrate. As the technique involves atom by atom mixing, the microstructure should be both pure and single phase, improving the fatigue life over diffusion-based fabrication methods. This technique also allows for user selected transformation temperatures over a wide temperature range, user selected external forms and internal geometry allowing for fast acting, high power actuators. By making thin foams and sheets, vibration isolation sheets can be used for integration into composite materials. The technique is a radical departure from conventional ingot processing, and will enable applications in high and low temperature actuator and switches in engines, and for thermal energy recovery systems in commercial applications.

Primary U.S. Work Locations and Key Partners



Shape Memory Effect Actuators from Chlorides Project Image

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Organizations Performing Work	Role	Type	Location
Shape Change Technologies	Lead Organization	Industry	Thousand Oaks, California
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
California	Ohio

Project Transitions

▶ **June 2014:** Project Start

✓ **December 2014:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/137716>)

Images



Project Image

Shape Memory Effect Actuators from Chlorides Project Image (<https://techport.nasa.gov/image/134346>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Shape Change Technologies

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

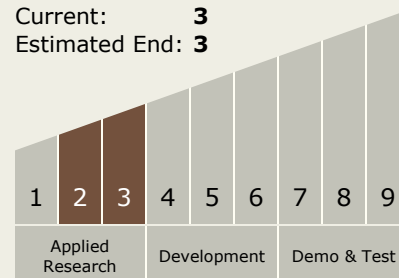
Carlos Torrez

Principal Investigator:

Andrew P Jardine

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.1 Materials
 - └ TX12.1.3 Flexible Material Systems

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System